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ABSTRACT

This survey was developed by the Ohio Sea Grant Education Program in 1979. It is been used every four years as a repeated measure of Ohio students' knowledge and attitudes about the oceans and Great Lakes, charting changes in those attributes as means of determining how well Ohio citizens are being prepared for decisionmaking about those bodies of water. The survey was modeled after Fortner's "Survey of Oceanic Attitudes and Knowledge" (SOAK), which was administered in Virginia to tenth graders in 1978. Questions for the SOAK were derived from a number of existing instruments and used with permission of the original authors. For applicability to Ohio efforts, questions were added to assess knowledge about the Great Lakes. The construction of the survey and a record of its use are discussed in this document. The three forms of the survey, which include semantic differentials and multiple-choice questions, and answers to the multiple-choice items constitute most of this document. (CW)

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OCEAN AND GREAT LAKES AWARENESS SURVEY

by ROSANNE W. FORTNER

Overview

The Ocean and Great Lakes Awareness Survey (hereafter referred to as the Survey) was developed by the Ohio Sea Grant Education Program in 1979. It has been used every four years as a repeated measure of Ohio students' knowledge and attitudes about the oceans and Great Lakes, charting changes in those attributes as means of determining how well Ohio citizens are being prepared for decisionmaking about those bodies of water. Interest in the Survey by researchers in other regions has led to the inclusion of the material in ERIC. This will assure greater access to what we believe to be the only regularly repeated environmental awareness test in North America and perhaps the world.

Objectives

In 1979 the young Ohio Sea Grant Education Program, funded by the Office of Sea Grant, National Oceanic and Atmospheric Administration, was in the early stages of curriculum development that would produce the Oceanic Education Activities for Great Lakes Schools (OEAGLS, pronounced "eagles"). As a pioneer in marine and aquatic education, the program had sought the guidance of an advisory board of community leaders and academicians. Topics of importance in the group's judgment were identified and some development had begun. It was not known, however, what Ohio students already knew about the oceans and Great Lakes. The earliest form of this Survey was therefore designed to:

1) provide baseline data on Ohio students' knowledge and attitudes about the oceans and Great Lakes,

2) identify critical areas in which performance was low on topics perceived by the advisors to be among the priorities for marine and aquatic education,

3) identify relationships that may exist between knowledge scores and attitudes, sex, race, and proximity to the Great Lakes, and

4) determine what experiences and/or media students perceived as the major source of their information about the oceans and Great Lakes.

For later administrations of the Survey, Objective 2 was expanded to include a measure of student progress in learning about the topics in the new OEAGLS. Objective 1 was modified to refer not to baseline data but to repeated measures of knowledge and attitudes. An overall goal of the repeated testing program was to evaluate the effectiveness of Ohio Sea Grant's education efforts (Mayer and Fortner, 1987).

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Development

The Survey was modeled after the author's "Survey of Oceanic Attitudes and Knowledge" (Fortner, 1978), which was administered in Virginia to tenth graders in 1978. Questions for the SOAK were derived from a number of existing instruments (listed in Fortner, 1978, AppendixB) and used with permission of the original authors. Richmond's (1976) model of three test forms to collect data on a larger number of items guided the format of the instrument.

For applicability to Ohio efforts, questions were added to assess knowledge about the Great Lakes. A number of these were derived from Howe and Price (1976), and others were developed by the author with Dr. Victor J. Mayer, Program Coordinator for Ohio Sea Grant Education. This latter set of new items was designed to evaluate knowledge of topics not covered by existing instruments but perceived to be important either by the advisors or within the Conceptual Scheme for Marine and Aquatic Education developed by Project COAST at the University of Delaware (Goodwin and Schaadt, 1978).

The pool of about 100 knowledge items was reviewed by a panel of experts in marine sciences, resource management, history and geography. Revised items were tested among fifth and ninth grade students in Central Ohio, and items were selected for the Survey based on topic salience, quality of distractors, and distribution across the curriculum. Equal numbers of science and social studies questions were selected, along with a smaller pool of humanities items. The items were distributed across Forms A, B, and C so that each form had the same number of items per subject area. Six items were held common across all forms as a test of equivalence of populations taking each form.

The resulting instrument (Appendix) had ten semantic differential attitude pairs each for referents of "The Ocean" and for "Lake Erie," twenty-five multiple choice and true/false knowledge items, and in later versions a single item identifying the students' perceived knowledge source.

Split-half reliability (KR-20) for the forms ranges from 0.38 to 0.51 for fifth grade, so only descriptive statistics are used for that grade level. For ninth grade, however, KR-20 ranges from 0.56 to 0.72.

Use of the Survey

The Survey to date has been administered in the fall and winter of 1979-80, 1983-4, and 1987-8 to students in randomly selected classrooms in Grades 5 and 9 in Ohio. In 1979, 79 fifth grade classes (1887 students) and 68 ninth grade classes (1786 students) participated; in 1983, 72 fifth grades and 69 ninth grades returned surveys; and in 1987, 34 fifth grades and 38 ninth grades participated.

Results of research using the Ocean and Great Lakes Awareness Survey have been reported in the literature (Fortner and Mayer, 1983, 1988). The survey has also been modified by a number of other researchers for regional needs.

This research has been supported by the Ohio State University and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, through the Office of Sea Grant.

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OCEAN AND GREAT LAKES AWARENESS SURVEY

FORM A

Part I

FEELINGS ABOUT THE OCEANS AND LAKE ERIE

On this page are two sets of words that can be used to describe the oceans and the Great Lakes. In each set, the words on the left are the opposite of the words on the right. Between the opposite words there are five numbers.

Pick a number for each pair of opposites. This number should show how you feel about the oceans or Lake Erie. Mark the number you have chosen in the proper space on your answer sheet.

THE OCEAN

Example A. big 1(A): 2(B): 3(C): 4(D): 5(E): small

If you feel the ocean is very big, you would choose A as your answer and mark it on your answer sheet.

Do not stop to think for a long time about your answers for this page. There are no right or wrong answers for this part.

THE OCEAN

1.	beautiful	1(A): 2(B): 3(C): 4(D): 5(E):	ugly
2.	fun	1(A): 2(B): 3(C): 4(D): 5(E):	boring
3.	strong	1(A): 2(B): 3(C): 4(D): 5(E):	weak
4.	tame	1(A): 2(B): 3(C): 4(D): 5(E):	wild
5.	familiar	1(A): 2(B): 3(C): 4(D): 5(E):	strange
6.	awful	1(A): 2(B): 3(C): 4(D): 5(E):	nice
7.	dirty	1(A): 2(B): 3(C): 4(D): 5(E):	clean
8.	important	1(A): 2(B): 3(C): 4(D): 5(E):	unimportant
9.	fierce	1(A): 2(B): 3(C): 4(D): 5(E):	gentle
10.	worthless	1(A): 2(B): 3(C): 4(D): 5(E):	valuable

LAKE ERIE

11.	beautiful	1(A): 2(B): 3(C): 4(D): 5(E):	ugly
12.	fun	1(A): 2(B): 3(C): 4(D): 5(E):	boring
13.	strong	1(A): 2(B): 3(C): 4(D): 5(E):	weak
14.	tame	1(A): 2(B): 3(C): 4(D): 5(E):	wild
15.	familiar	1(A): 2(B): 3(C): 4(D): 5(E):	strange
16.	awful	1(A): 2(B): 3(C): 4(D): 5(E):	nice
17.	dirty	1(A): 2(B): 3(C): 4(D): 5(E):	clean
18.	important	1(A): 2(B): 3(C): 4(D): 5(E):	unimportant
19.	fierce	1(A): 2(B): 3(C): 4(D): 5(E):	gentle
20.	worthless	1(A): 2(B): 3(C): 4(D): 5(E):	valuable

OCEAN AND GREAT LAKES AWARENESS SURVEY

Part II

KNOWLEDGE ABOUT THE OCEAN AND GREAT LAKES

In this section of the survey there is only one right answer for each question. Read each question carefully and choose the answer you feel is the correct one. Put your answer in the proper space on your answer sheet.

21. An important difference between oceans and most lakes is that oceans

    A. have waves.
    B. have algae.
    C. are polluted.
    D. are salty.

22. Longfellow's "Song of Hiawatha" begins with these lines:
    "By the shores of Gitchee Gumme, by the shining big-sea waters,..."
    The poet was talking about

    A. the Atlantic Ocean.
    B. Lake Superior.
    C. the Mediterranean Sea.
    D. the Mississippi River.

23. The amount of the earth's surface covered by water is about

    A. 1/4.
    B. 1/3.
    C. 1/2.
    D. 2/3.

24. Which one of the Great Lakes forms part of Ohio's northern border?

    A. Superior
    B. Michigan
    C. Erie
    D. Ontario
    E. Huron

25. The world's oldest cities are found near

    A. lakes.
    B. sea coasts.
    C. mountains.
    D. plains.

26. A fish uses its gills to get

    A. water.
    B. oxygen.
    C. vitamins.
    D. calories.

27. On the following map, there is an X on Lake

A. Superior.
B. Erie.
C. Huron.
D. Ontario.
E. Michigan.

28. Which of the following states has no seacoast?

A. New Hampshire.
B. Montana.
C. Mississippi.
D. Texas.

29. Walleye eat gizzard shad and gizzard shad eat algae. In this example, the gizzard shad are

A. producers.
B. decomposers.
C. consumers.
D. scavengers.

30. Oil spills from damaged tankers and offshore wells account for how much of the oil pollution in the ocean?

A. 1/10
B. 1/4
C. 1/2
D. 3/4

31. In the story The Cay a blind boy and an old man

A. find a buried treasure left by pirates.
B. build and sail their own ship.
C. discover the remains of a prehistoric fish.
D. become marooned on an island.

32. When it is high tide on one side of the earth, the opposite side of the earth experiences

A. low tide.
B. high tide.
C. neap tide.
D. spring tide.

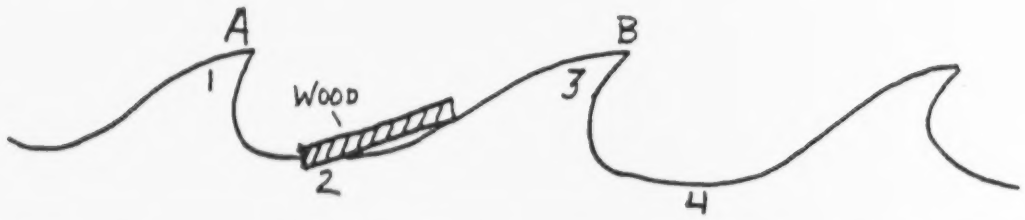
33. Approximately what percent of the U.S. population lives within 50 miles of the coast?

A. 10%
B. 30%
C. 60%
D. 90%

34. The sailor's knot called a bowline is useful for

A. making a loop that will not close.
B. joining two lines of the same size.
C. joining two lines of different sizes.
D. tying hard to a round object.

35.



In the above diagram, after the wave moves from position A to position B, the driftwood would be in position

A. 1.
B. 2.
C. 3.
D. 4.

36. Energy for marine life comes from the

A. sun.
B. water.
C. soil.
D. rocks.

37. Many merchant (cargo) ships are registered by and fly flags of a few small countries. This is because these countries

A. have large navies.
B. export much more material than most nations.
C. provide tax advantages to ship owners.
D. are politically neutral.

38. The reason you can find fossil clam shells on the top of some mountains is that

A. someone dropped them there.
B. that area was once under water.
C. they were clams that once lived on land.
D. a volcano brought them to the surface.

39. The sale of some Great Lakes food fish has been stopped because the fish have been found to contain high levels of

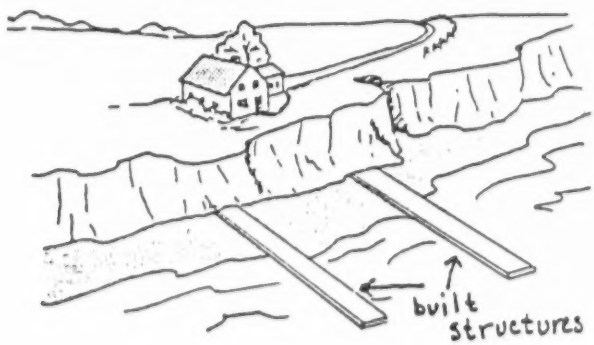
A. arsenic.
B. lead.
C. kepone.
D. PCB's.

40. On a hot summer day, air over the beach is

A. warmer than air over Lake Erie.
B. cooler than air over Lake Erie.
C. the same temperature as air over Lake Erie.
D. the same temperature as Lake Erie water.

41. The Edmund Fitzgerald was

A. a blockade runner ship in the Revolutionary War.
B. an ore boat that sank in Lake Superior.
C. a battleship in Perry's Lake Erie fleet.
D. an ocean liner that hit an iceberg and sank.



42. Structures like the ones in the above diagram are mainly built to

A. hold back the beach sand.
B. serve as a fishing location.
C. mark property boundaries.
D. serve as a place for catching crabs.

43. Scrimshaw was

A. one of the "tall ships" that came to the U.S. for the Bicentennial.
B. the type of writing found in the Dead Sea Scrolls.
C. a series of knots used in sail riggings.
D. the whaler's art of carving on whale teeth and bones.

44. Salt marshes may be disappearing because

A. high sea level is making the oceans grow larger.
B. marsh water is draining out into the oceans.
C. people are filling in the marshes to make more land.
D. there is less rain to fill the marshes.

45. Who said "Don't give up the ship?"

A. John Paul Jones in the Revolutionary War
B. Admiral Farragut in the Civil War
C. Commodore Perry in the Battle of Lake Erie
D. Napoleon in the Battle of Waterloo

46. The area from which a river collects its water is called a

A. gradient.
B. watershed.
C. flood plain.
D. river basin.

47. From the Port of Toledo, the products that are shipped are chiefly

A. foodstuffs.
B. machinery.
C. miscellaneous goods.
D. raw materials for industry.

48. The draft of a ship is the

A. amount of water it displaces.
B. depth of its cargo hold.
C. number of tons of cargo it can carry.
D. depth of water it needs to float.

49. A parasitic fish found in Lake Erie is the

A. sculpin.
B. livebearer.
C. lamprey.
D. sucker.

50. Which waterway connects the Great Lakes to the Atlantic Ocean?

A. Gulf Stream
B. St. Lawrence Seaway
C. Lake Ontario
D. Mississippi River

51. What is a major use of beach ridges in Northern Ohio?

A. highway routes
B. garbage disposal
C. ground water sources
D. boat launching ramps

52. In the Great Lakes, boats going away from the ocean are said to be

A. outbound.
B. downbound.
C. inbound.
D. upbound.

53. In order to feed more people, we should try

A. harvesting plants and animals that are lower in food chains.
B. eating more meat and fewer vegetables.
C. raising more sheep and fewer cows.
D. harvesting as many walleyes as possible.

54. A major "industry" of northern Ohio and the Lake Erie Islands that results from the influence of the lake on climate is

A. electrical power generation.
B. raising grapes.
C. producing steel.
D. shipping.

55. When an oil spill occurs in U.S. waters, who is supposed to pay for the clean-up costs?

A. The spiller
B. The taxpayers
C. The Coast Guard
D. The Federal government

56. Which of the following was the most important in teaching you about the oceans and Great Lakes?

A. Movies and television
B. Newspapers, magazines and books
C. Classes in school
D. Doing things at the beach or on the water
E. Public aquaria, museums, etc.

OCEAN AND GREAT LAKES AWARENESS SURVEY

FORM B

Part I

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LAKE ERIE

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Part II

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    The poet was talking about

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    D. the Mississippi River.

23. The amount of the earth's surface covered by water is about

    A. 1/4.
    B. 1/3.
    C. 1/2.
    D. 2/3.

24. Which one of the Great Lakes forms part of Ohio's northern border?

    A. Superior
    B. Michigan
    C. Erie
    D. Ontario
    E. Huron

25. The world's oldest cities are found near

    A. lakes.
    B. sea coasts.
    C. mountains.
    D. plains.

26. A fish uses its gills to get

    A. water.
    B. oxygen.
    C. vitamins.
    D. calories.

27. In Herman Melville's book, "Moby Dick" was a

A. sailor.
B. whale.
C. killer shark.
D. whaling boat.

28. The first white men to see the Great Lakes were

A. Pilgrims.
B. Buffalo hunters.
C. French voyageurs.
D. Colonists fleeing from the Indians.

29. On the following map, there is an X on Lake

A. Superior.
B. Erie.
C. Huron.
D. Ontario.
E. Michigan.

30. Pollutants from the land are often carried to the ocean by

A. wind.
B. rivers.
C. rain.
D. clouds.

31. At the present time, food for humans from the sea

A. is mainly plant life from the Pacific.
B. is solving the world's food shortage.
C. makes up a large share of the food supply.
D. makes up a small share of the food supply.

32. The inventor of the aqualung now worn by skin divers was

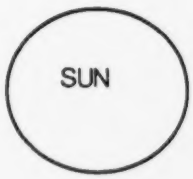
A. Thomas Jefferson.
B. Jacques Cousteau.
C. Benjamin Franklin.
D. Robert Goddard.

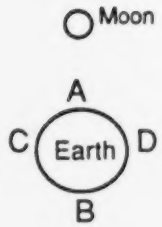
33. Sea lampreys have been a problem in the Great Lakes because they

A. eat yellow perch.
B. use up food needed by valuable fish.
C. destroy water plants growing near the shore.
D. suck the blood from lake trout.

34. In the figure below, the highest tides are at points

A. A and B.
B. A and C.
C. B and D.
D. C and D.





35. Ships move from Lake Erie to Lake Ontario by

A. the Welland Canal.
B. the Niagara River.
C. the St. Lawrence River.
D. the Detroit River.

36. Deposits of natural gas have been discovered under Lake Erie.

A. true
B. false

37. The United States claims the right to control fishing within _____ miles of the shoreline.

A. 3
B. 12
C. 100
D. 200

38. There is evidence that

A. ocean basins are older than continents.
B. ocean basins are younger than continents.
C. continents are the same age as ocean basins.
D. some continents are younger than some ocean basins.

39. The main U.S. Government agency concerned with the study of the oceans is

A. NOAA.
B. EPA.
C. NASA.
D. CIA.

5B

40. Plankton is

A. a school of fast moving fish.
B. floating plant and animal life.
C. non-living substances in the sea.
D. material for making wooden boats.

41. A famous statement made by Perry at the Battle of Lake Erie was

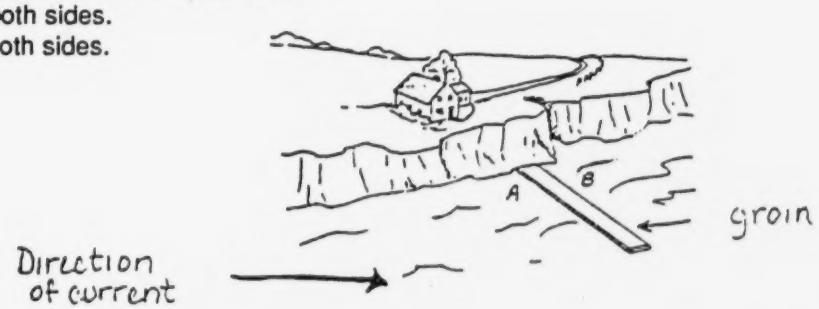
A. "Don't fire until you see the whites of their eyes."
B. "I have not yet begun to fight."
C. "The only thing we have to fear is fear itself."
D. "We have met the enemy and they are ours."

42. Some types of fish were caught in great numbers in the past, but the number caught is lower now because

A. not as many people want to eat fish, so there is less demand for them.
B. there are fewer people interested in fishing for a living.
C. the world's climate has gotten colder, killing off many fish.
D. there aren't as many of these kinds of fish around anymore.

43. The groin in the following picture will cause

A. sand to build up at side A and erode at side B.
B. sand to erode from side A and build up at side B.
C. erosion to occur on both sides.
D. sand to build up on both sides.



44. In the statement, "Water, water everywhere and not a drop to drink," the poet was referring to

A. sea water.
B. rain water.
C. polluted water.
D. a drought.

45. Which of the following sayings did not begin as a reference to part of a sailing ship?

A. Down the hatch.
B. Keep an even keel.
C. Know the ropes.
D. Hold that line.

46. The substance most responsible for water quality problems in Lake Erie is

A. phosphate.
B. toxic waste.
C. industrial chemicals.
D. acid rain.

47. What rights does an Economic Zone give a nation?

A. Enforcement of customs, sanitation, and financial laws of the country.
B. Jurisdiction over pipes and cables laid by other nations.
C. Authority to control pollution from ships.
D. Exclusive rights to resources in water and sea bed.

48. During the War of 1812 the military control of Lake Erie was essential to the American Forces because

A. it provided a necessary water and food (fish) supply.
B. it was a transportation route for men and supplies.
C. all of the important forts were located on it.
D. most of the men in the American Army lived along it.

49. Which of the following is probably <u>not</u> a reason why perch lay a large number of eggs?

A. There are many other fish that eat the perch.
B. Many of the eggs do not hatch.
C. Lake Erie is a huge body of water and can support them all.
D. The odds are against the survival of most of the perch.

50. Which statement is true concerning Great Lakes ore freighter design?

A. All freighters are more than 300 feet long.
B. Most freighters have a draft of 80 feet.
C. Cargo holds keep cargo in a small, concentrated area.
D. The freighter is often about 10 times longer than it is wide.

51. Relatively high amounts of which element below will enhance the water quality of a river?

A. Oxygen
B. Nitrate
C. Arsenic
D. Chloride

52. The most likely cause of seasonal changes in the lake level is

A. rate of evaporation.
B. regulation of the lake.
C. erosion of the outlet of the lake.
D. precipitation.

7B

53. Which of the following best describes an estuary?

A. a swamply area of a stream or river
B. a part of a stream influenced by lake or ocean levels
C. a stagnant lake found in tropical latitudes
D. a large bird found in Africa

54. Why was the Ohio canal system built?

A. To provide drinking water to towns in the interior of the state.
B. To make easier the movement of people and products from place to place.
C. To allow fish to travel from Lake Erie into the interior of Ohio for use as a food source.
D. Congress passed a law creating canals.

55. The cheapest method of shipping iron ore from Duluth, MN, to Buffalo, NY, is by way of

A. truck.
B. train.
C. airplane.
D. lake freighter.

56. Which of the following was the most important in teaching you about the oceans and Great Lakes?

A. Movies and television
B. Newspapers, magazines and books
C. Classes in school
D. Doing things at the beach or on the water
E. Public aquaria, museums, etc.

OCEAN AND GREAT LAKES AWARENESS SURVEY

FORM C

Part I

FEELINGS ABOUT THE OCEANS AND LAKE ERIE

On this page are two sets of words that can be used to describe the oceans and the Great Lakes. In each set, the words on the left are the opposite of the words on the right. Between the opposite words there are five numbers.

Pick a number for each pair of opposites. This number should show how you feel about the oceans or Lake Erie. Mark the number you have chosen in the proper space on your answer sheet.

THE OCEAN

Example A. big 1(A): 2(B): 3(C): 4(D): 5(E): small

If you feel the ocean is very big, you would choose A as your answer and mark it on your answer sheet.

Do not stop to think for a long time about your answers for this page. There are no right or wrong answers for this part.

THE OCEAN

1.	beautiful	1(A): 2(B): 3(C): 4(D): 5(E):	ugly
2.	fun	1(A): 2(B): 3(C): 4(D): 5(E):	boring
3.	strong	1(A): 2(B): 3(C): 4(D): 5(E):	weak
4.	tame	1(A): 2(B): 3(C): 4(D): 5(E):	wild
5.	familiar	1(A): 2(B): 3(C): 4(D): 5(E):	strange
6.	awful	1(A): 2(B): 3(C): 4(D): 5(E):	nice
7.	dirty	1(A): 2(B): 3(C): 4(D): 5(E):	clean
8.	important	1(A): 2(B): 3(C): 4(D): 5(E):	unimportant
9.	fierce	1(A): 2(B): 3(C): 4(D): 5(E):	gentle
10.	worthless	1(A): 2(B): 3(C): 4(D): 5(E):	valuable

LAKE ERIE

11.	beautiful	1(A): 2(B): 3(C): 4(D): 5(E):	ugly
12.	fun	1(A): 2(B): 3(C): 4(D): 5(E):	boring
13.	strong	1(A): 2(B): 3(C): 4(D): 5(E):	weak
14.	tame	1(A): 2(B): 3(C): 4(D): 5(E):	wild
15.	familiar	1(A): 2(B): 3(C): 4(D): 5(E):	strange
16.	awful	1(A): 2(B): 3(C): 4(D): 5(E):	nice
17.	dirty	1(A): 2(B): 3(C): 4(D): 5(E):	clean
18.	important	1(A): 2(B): 3(C): 4(D): 5(E):	unimportant
19.	fierce	1(A): 2(B): 3(C): 4(D): 5(E):	gentle
20.	worthless	1(A): 2(B): 3(C): 4(D): 5(E):	valuable

OCEAN AND GREAT LAKES AWARENESS SURVEY

Part II

KNOWLEDGE ABOUT THE OCEAN AND GREAT LAKES

In this section of the survey there is only one right answer for each question. Read each question carefully and choose the answer you feel is the correct one. Put your answer in the proper space on your answer sheet.

21. An important difference between oceans and most lakes is that oceans

    A. have waves.
    B. have algae.
    C. are polluted.
    D. are salty.

22. Longfellow's "Song of Hiawatha" begins with these lines:
    "By the shores of Gitchee Gumme, by the shining big-sea waters,..."
    The poet was talking about

    A. the Atlantic Ocean.
    B. Lake Superior.
    C. the Mediterranean Sea.
    D. the Mississippi River.

23. The amount of the earth's surface covered by water is about

    A. 1/4.
    B. 1/3.
    C. 1/2.
    D. 2/3.

24. Which one of the Great Lakes forms part of Ohio's northern border?

    A. Superior
    B. Michigan
    C. Erie
    D. Ontario
    E. Huron

25. The world's oldest cities are found near

    A. lakes.
    B. sea coasts.
    C. mountains.
    D. plains.

26. A fish uses its gills to get

    A. water.
    B. oxygen.
    C. vitamins.
    D. calories.

27. On the following map, there is an X on Lake

A. Superior.
B. Erie.
C. Huron.
D. Ontario.
E. Michigan.

28. In what direction do the currents usually flow in Lake Erie?

A. from west to east
B. from east to west.
C. from north to south.
D. from south to north.

29. Which of the following is the cheapest way to transport large amounts of cargo?

A. ship
B. rail
C. truck
D. airline

30. Along the east coast of the United States, high tides occur about every

A. six hours.
B. twelve hours.
C. eighteen hours.
D. twenty-four hours.

31. To pull together in raising the sails or the anchor the crew of an early sailing ship would sing songs called

A. chanteys.
B. carols.
C. timers.
D. canticles.

32. A person watching a ship going from a river into the ocean would see the ship

A. floating higher in the river than in the ocean.
B. floating lower in the river than in the ocean.
C. stay at the same level in both areas.
D. go through a lock.

33. Most beach sand comes from

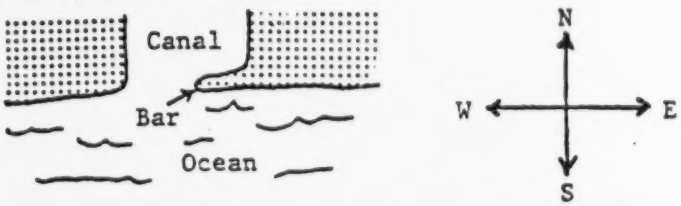
A. rock and shell fragments.
B. salts from the water.
C. gravel pits.
D. pieces of glass.

34. A ship can go from sea level (0 feet elevation) to Lake Superior (600 feet elevation) because of a system of

    A. canals.
    B. elevators.
    C. locks.
    D. rapids.

35. The English language contains many familiar expressions that began as sayings about the sea. Which of the following is <u>not</u> one of these sayings?

    A. Time and tide wait for no man.
    B. As fickle as a fishwife.
    C. Any old port in a storm.
    D. Red sky at night, sailors delight.



36. In the above diagram, the sand bar across the mouth of the canal is caused by waves moving toward the

    A. NW.
    B. NE.
    C. SW.
    D. SE.

37. In mythology the Roman god of the sea was

    A. Apollo.
    B. Neptune.
    C. Demeter.
    D. Zeus.

38. Some types of food fish no longer live in Lake Erie because

    A. overfishing wiped them all out.
    B. there is not enough food for them.
    C. they cannot live in polluted water.
    D. the lake has become too cold for them.

39. Kelp, a large seaweed, cannot grow in the deep ocean because

    A. the temperature is too low.
    B. the amount of light is too low.
    C. the amount of oxygen is too low.
    D. the pressure is too great.

40. Nuclear power plants are usually built near bodies of water because the water is

A. an added safety factor in case of a radiation leak.
B. used to cool the reactors.
C. an extra power source.
D. a place to dump radioactive wastes.

41. The culture of many countries has been influenced by explorers and settlers who came by the sea from other nations. What is the principal language spoken in Brazil?

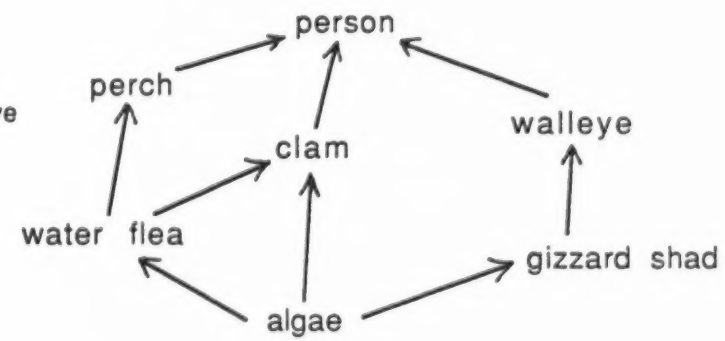
A. English
B. Spanish
C. German
D. Portuguese

42. The OPEC countries are ones that

A. export oil.
B. control sea trade.
C. have large navies.
D. farm the sea.

43. In the food web shown, which animals would compete for food?

A. perch and clam
B. walleye and perch
C. clam and person
D. gizzard shad and walleye



44. The Mid-Atlantic Ridge is

A. one of the oldest parts of the sea floor.
B. what is left of an ancient land mountain range.
C. one of the youngest parts of the sea floor.
D. what is left of an old coral reef.

45. The Great Lakes are

A. mildly involved with international shipping.
B. not very much involved with international shipping.
C. very much involved with international shipping.
D. involved only in local trade between Lake ports.

46. PCBs are a (an):

A. naturally occurring chemical found in the rocks of the Great Lakes region.
B. product of the burning of coal.
C. man-made chemical used in many products.
D. organic chemical produced by fish and other aquatic organisms.

47. Which of the Great Lakes lies entirely within the United States boundaries?

A. Lake Michigan
B. Lake Erie
C. Lake Ontario
D. Lake Superior

48. After 1860, the use of the canals in Ohio began to decline. The major reason for this was

A. the Civil War.
B. the expansion of railroads.
C. a drought that caused the water in the canals to disappear.
D. a surplus of farm products in New York and other eastern states.

49. What is optimum yield in relation to a yellow perch population?

A. The best number of fingerlings to use to re-stock the lake.
B. The largest number of eggs that a female perch can lay.
C. The largest number of perch that a lake can support.
D. The best number of perch to catch in any one year.

50. Where would you find major fishing areas of the world?

A. Above the deep ocean basins.
B. Over wide continental shelves.
C. Along the Mid-Atlantic Ridge.
D. In straits between two larger bodies of water.

51. Small temporary (day or two) changes in lake levels can be caused by

A. high winds blowing in a single direction.
B. regulating the level of the lake.
C. changes in the number of ships in the lake.
D. changes in the rate of precipitation over the lake.

52. The American ships that were engaged in the Battle of Lake Erie were built in

A. Norfolk, Virginia.
B. Groton, Connecticut.
C. Erie, Pennsylvania.
D. Milwaukee, Wisconsin.

53. Eutrophication means:

A. poisoning by chemicals.
B. growth of plants and animals.
C. the aging of a body of water.
D. invasion of new fish species.

54. A major reason for trying to preserve estuaries world wide is that they

A. contain high concentrations of metal ores.
B. serve as testing grounds for pollution control.
C. serve as breeding grounds for fish.
D. provide excellent deep water harbors.

55. The major type of product carried by Great Lakes freighters is

A. manufactured goods.
B. fresh food products.
C. bulk products.
D. chemical products.

56. Which of the following was the most important in teaching you about the oceans and Great Lakes?

A. Movies and television
B. Newspapers, magazines and books
C. Classes in school
D. Doing things at the beach or on the water
E. Public aquaria, museums, etc.

OCEAN AND GREAT LAKES AWARENESS SURVEY

ANSWERS

FORM A	FORM B	FORM C
21. D	21. D	21. D
22. B	22. B	22. B
23. D	23. D	23. D
24. C	24. C	24. C
25. B	25. B	25. B
26. B	26. B	26. B
27. B	27. B	27. C
28. B	28. C	28. A
29. C	29. E	29. A
30. A	30. B	30. B
31. D	31. D	31. A
32. B	32. B	32. B
33. C	33. D	33. A
34. A	34. A	34. C
35. B	35. A	35. B
36. A	36. A	36. A
37. C	37. D	37. B
38. B	38. B	38. C
39. D	39. A	39. B
40. A	40. B	40. B
41. B	41. D	41. D
42. A	42. D	42. A
43. D	43. A	43. A
44. C	44. A	44. C
45. C	45. D	45. C
46. B	46. A	46. C
47. A	47. D	47. A
48. D	48. B	48. B
49. C	49. C	49. D
50. B	50. D	50. B
51. A	51. A	51. A
52. D	52. D	52. C
53. A	53. B	53. C
54. B	54. B	54. C
55. A	55. D	55. C